

NASA Worldview: Explore the Earth from Past to Present with Global Satellite Observations



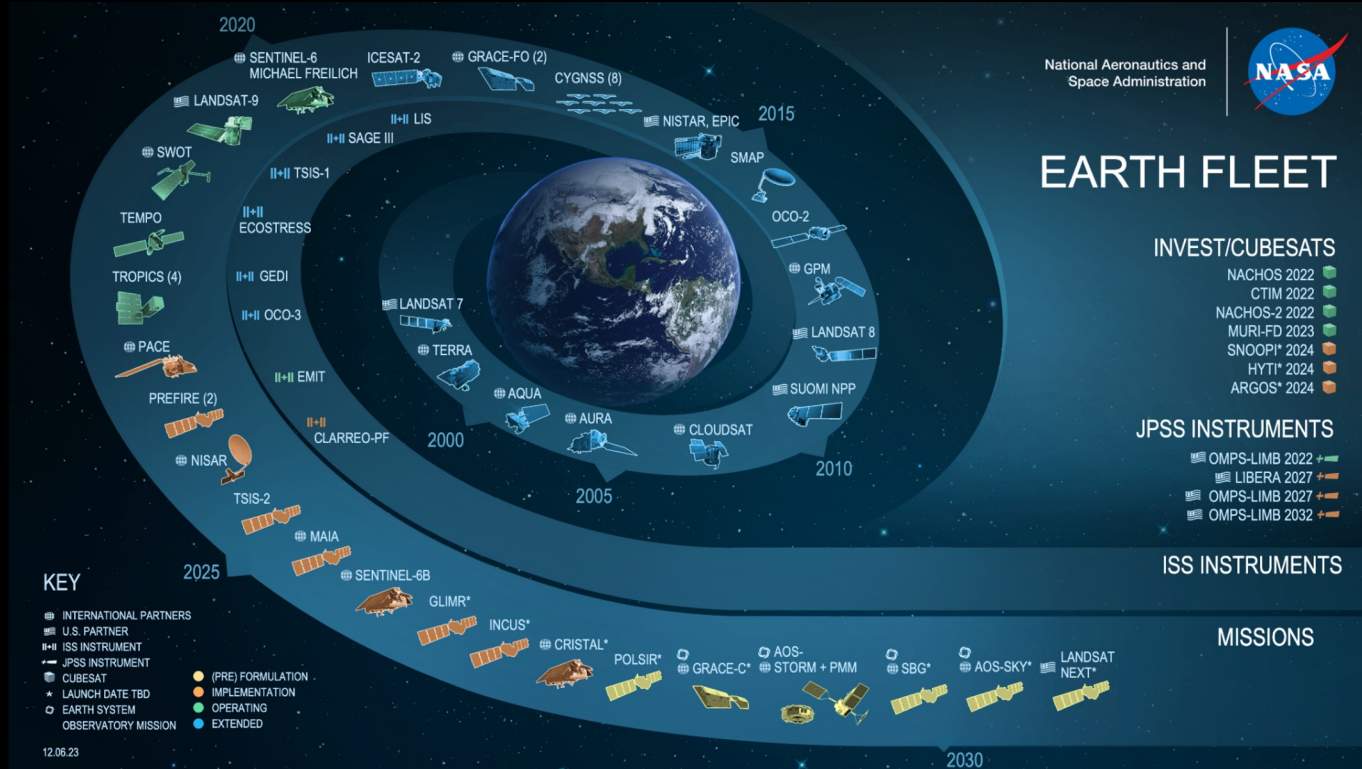
<https://worldview.earthdata.nasa.gov>

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Outline

- NASA Earth Science Missions
- NASA EOSDIS
- What is NASA Worldview and GIBS?
- What do Worldview and GIBS provide?
- Key Features of Worldview

NASA Earth Science Missions

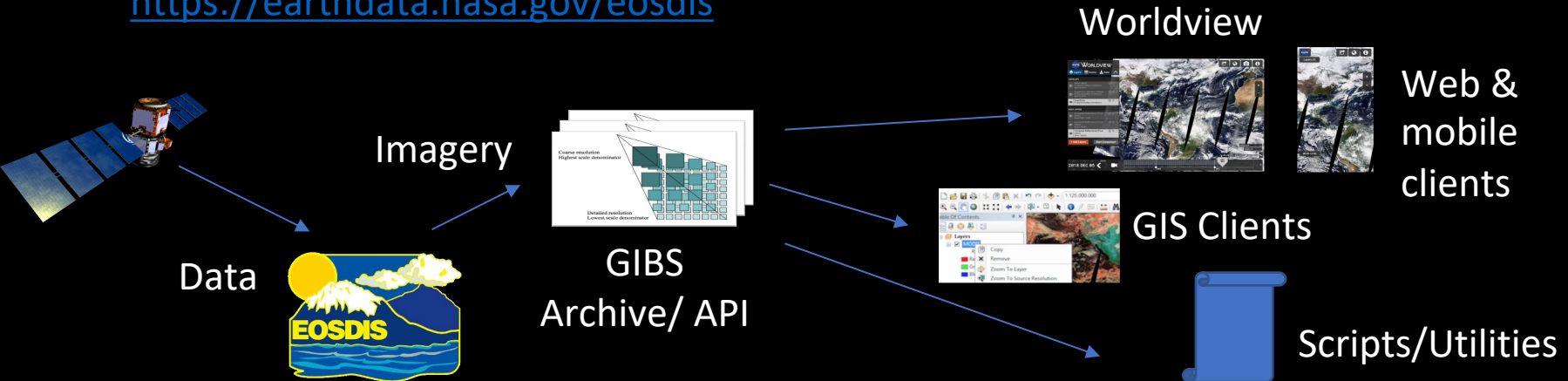


Data collected by NASA are free for all to use - NASA's data policy ensures that all NASA data are available **fully, openly, and without restrictions.**

NASA Earth Observing System Data and Information System (EOSDIS)

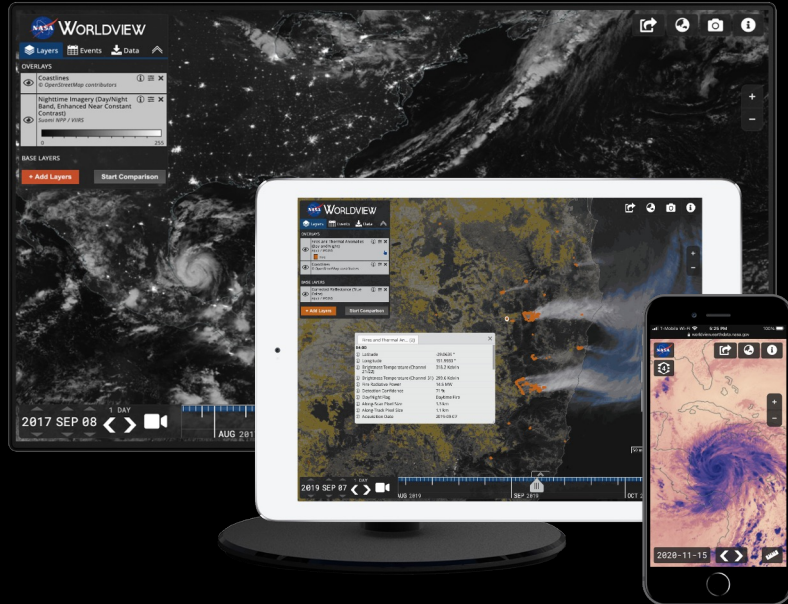
<https://earthdata.nasa.gov/eosdis>

- Responsible for processing, archiving and disseminating NASA's vast collection of data from Earth observing satellite, airborne, and ground based missions, as well as socio-economic data - over 70 petabytes!
- Worldview and the Global Imagery Browse Services (GIBS) are the imagery visualization components of EOSDIS.



What is NASA Worldview and GIBS?

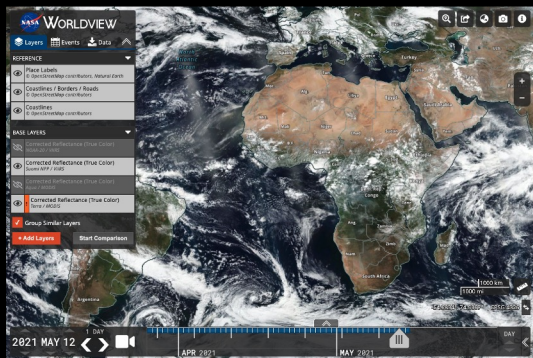
Worldview and the Global Imagery Browse Services (GIBS) provide a **visual-first** approach to finding and using Earth observations.



- **Worldview** is an open source **web mapping application** - interactively browse NASA's global satellite imagery within hours of it being acquired as well as imagery from the past few decades.
worldview.earthdata.nasa.gov
- **GIBS** is a **set of services** - fast and open access to 1000+ NASA imagery products for Worldview and any other applications via standards-based web services.
earthdata.nasa.gov/gibs
- Also available is **Worldview Snapshots** - a **lightweight tool** for creating image snapshots in a variety of file formats from a selection of popular NASA satellite imagery base layers and overlays.
wvs.earthdata.nasa.gov

Worldview and GIBS provide...

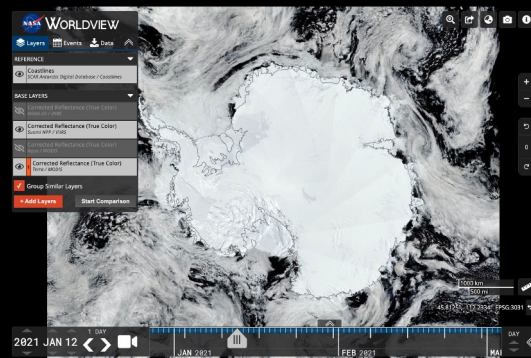
- Imagery in 4 map projections: Geographic, Arctic Polar Stereographic, Antarctic Polar Stereographic, Web Mercator (via GIBS API only)



Geographic/Lat-Long (EPSG: 4326)



Arctic Polar Stereographic (EPSG: 3413)



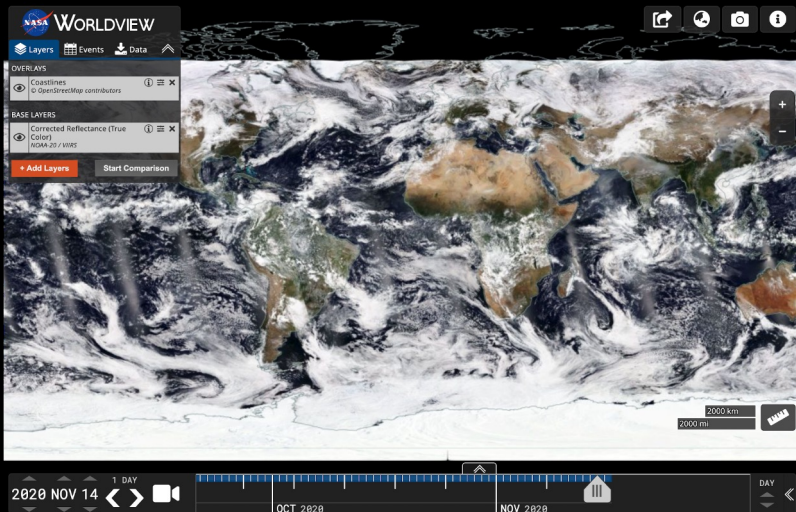
Antarctic Polar Stereographic (EPSG: 3031)

- Imagery/Data types: Raster and vector
- Spatial resolution: Ranging from 30 meter to 375 meter to 1 degree per pixel
- Temporal resolution: 10 minutes, daily, monthly, yearly (and others in between)
- Latency from observation to availability: 40 mins for geostationary, 3 hours (“near real-time”) for many others, longer for everything else.

Raster Imagery Types

Opaque “Base Layers”

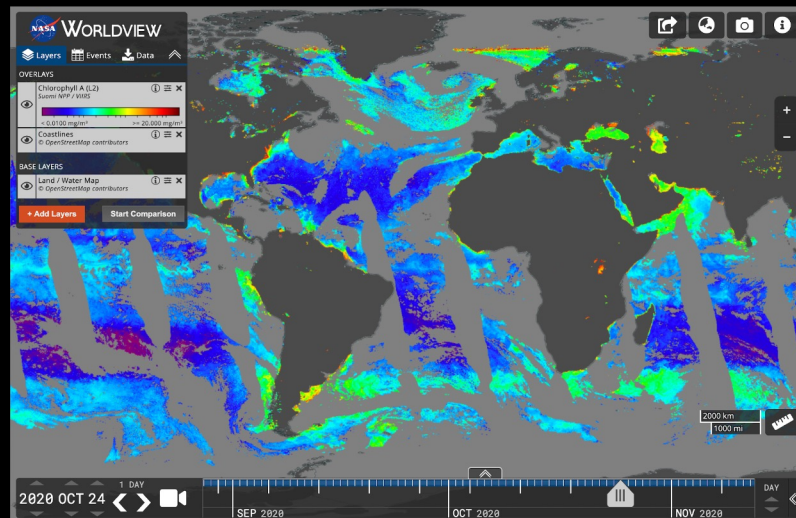
- *Rarely* provide a color bar mapping data values to RGB.
- Interpreted “as is”.



Corrected Reflectance (True Color), NOAA-20 / VIIRS

Transparent-capable “Overlays”

- *Regularly* display a color bar mapping data values to RGB.
- Palettes can be changed, thresholded, etc.

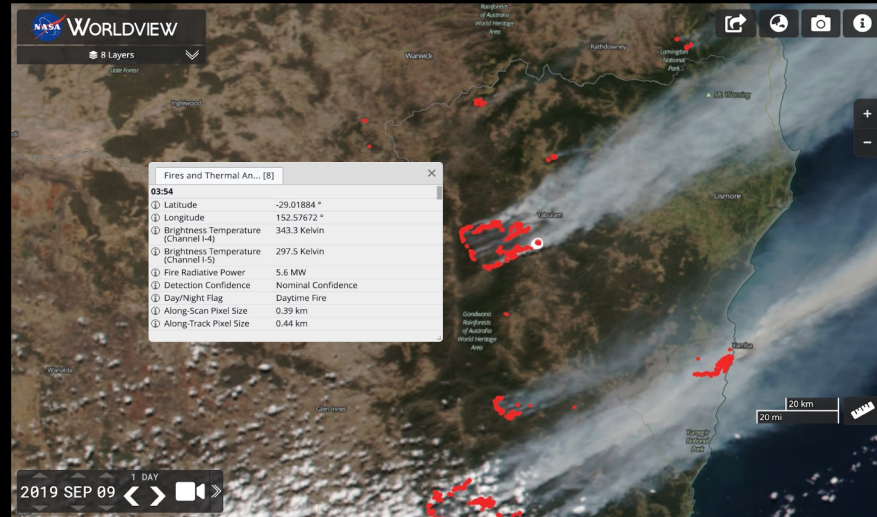


Chlorophyll a, Suomi NPP / VIIRS

Vector Data

“Static” Features

- Points, Lines, and Polygons supported.
- Associated metadata/attribute information for user analysis.



Fires and Thermal Anomalies, NOAA-20 / VIIRS

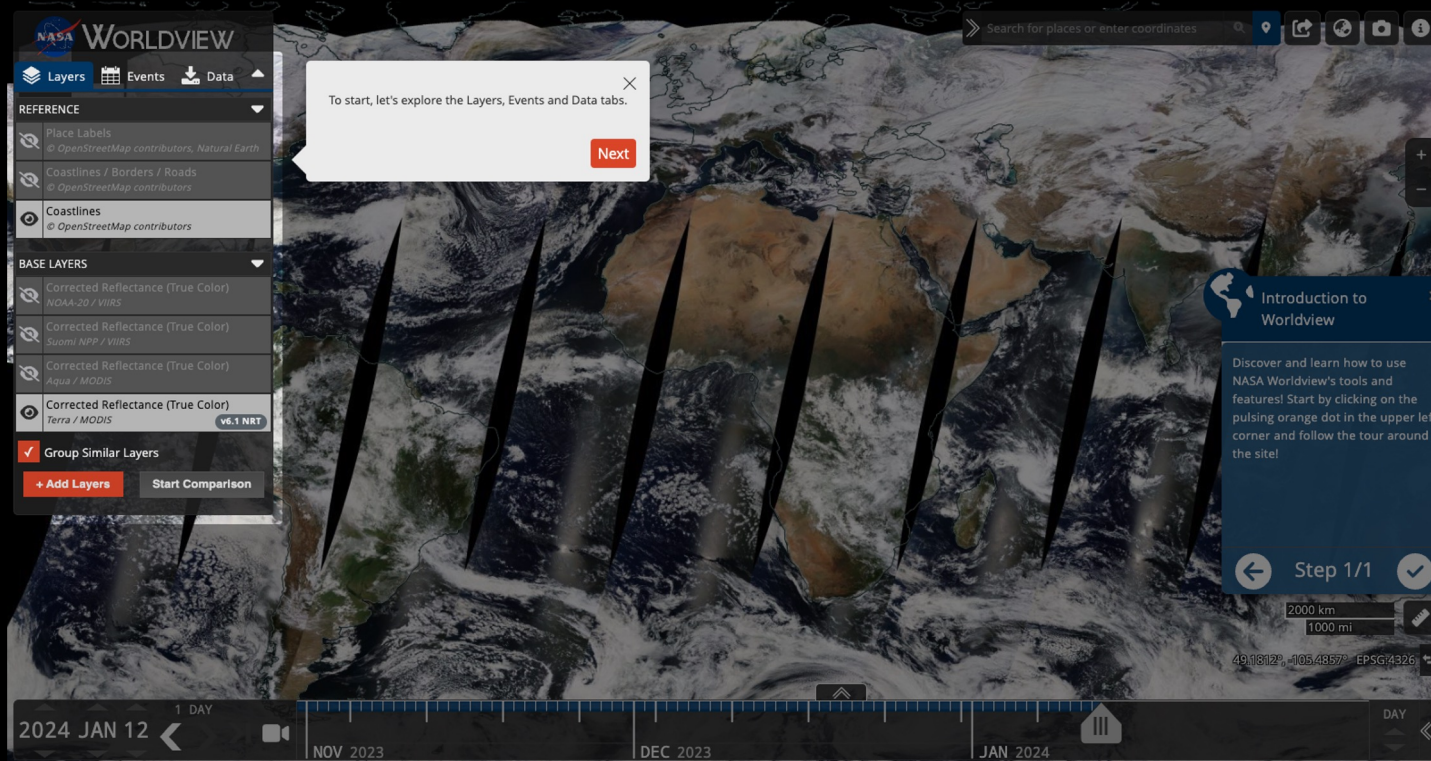
Some Features in Worldview

- Tour Stories: Learn how to use Worldview, how to visualize certain imagery layers, and explore interesting past natural events.
- Animation: Ability to create animations and export to animated GIFs
- Comparison: Allows users to compare imagery side by side
- Embeddable widget: Allows users to embed Worldview onto their own webpage
- Events: Provides a listing of events provided through the Earth Observatory Natural Event Tracker (EONET)
- Data Download: Download related data via Earthdata Search

Tour Stories

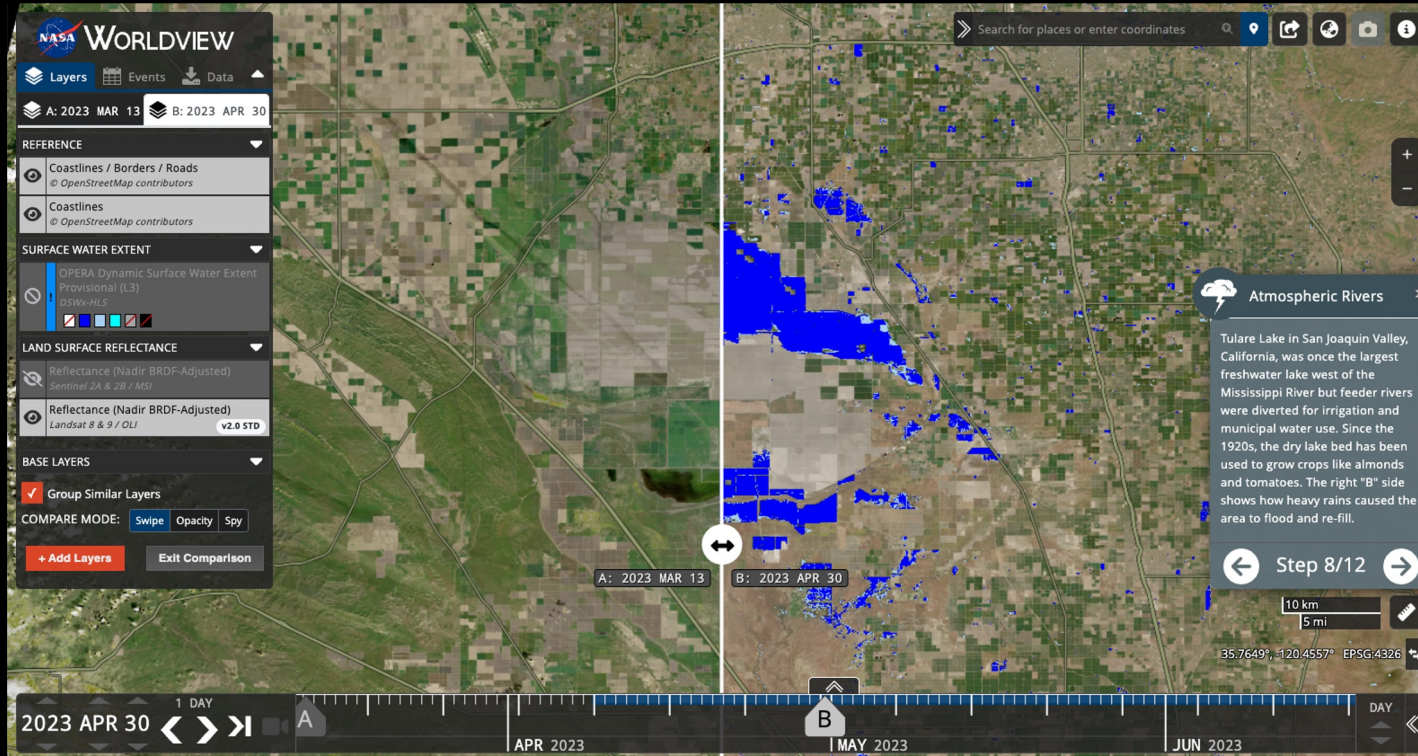
The screenshot displays the NASA Worldview web application. On the left, a sidebar contains the 'Layers' panel with sections for 'REFERENCE' (Place Labels, Coastlines / Borders / Roads, Coastlines) and 'BASE LAYERS' (Corrected Reflectance from various sensors like VIIRS, NPP, MODIS, and Terra). A 'Group Similar Layers' button is checked, and there are '+ Add Layers' and 'Start Comparison' buttons. The main area features a 'Welcome to Worldview!' dialog box with a close button. The dialog text reads: 'Visually explore the past and the present of this dynamic planet from a satellite's perspective. Select from an array of stories below to learn more about Worldview, the satellite imagery we provide and events occurring around the world. [Start using Worldview](#)→'. Below the text is a 3x3 grid of story thumbnails: 'Atmospheric Rivers', 'Assessing Floodwaters', 'Night Lights from NASA's Black Marble', 'Geostationary Imagery Every 10 Minutes!', 'Satellite Detections of Fire (2021 update)', and 'Introduction to Worldview'. A checkbox at the bottom of the dialog is labeled 'Do not show until a new story has been added.' The background is a satellite map of Africa with a black arrow pointing to the Atlantic Ocean. The bottom of the interface shows a timeline from 2024 JAN 12 to JAN 2024, with a '1 DAY' time scale and a 'DAY' button. A search bar at the top right says 'Search for places or enter coordinates'.

Introduction to Worldview Tour Story



<https://go.nasa.gov/3037b9>

Atmospheric Rivers Tour Story



Layer Picker

The screenshot displays the NASA WorldView Layer Picker interface. On the left, a sidebar contains the NASA logo, 'WORLDVIEW', and navigation tabs for 'Layers', 'Events', and 'Data'. Below these are sections for 'REFERENCE' (Place Labels, Coastlines/Borders/Roads, Coastlines), 'BASE LAYERS' (Corrected Reflectance from NOAA-20/VIIRS, Suomi NPP/VIIRS, Aqua/MODIS, Terra/MODIS v6.1 NRT), and a 'Group Similar Layers' section with '+ Add Layers' and 'Start Comparison' buttons.

The main panel features a search bar and tabs for 'Hazards And Disasters', 'Science Disciplines', 'Featured', and 'Recent'. It is organized into a grid of categories, each with a representative image and a list of available layers:

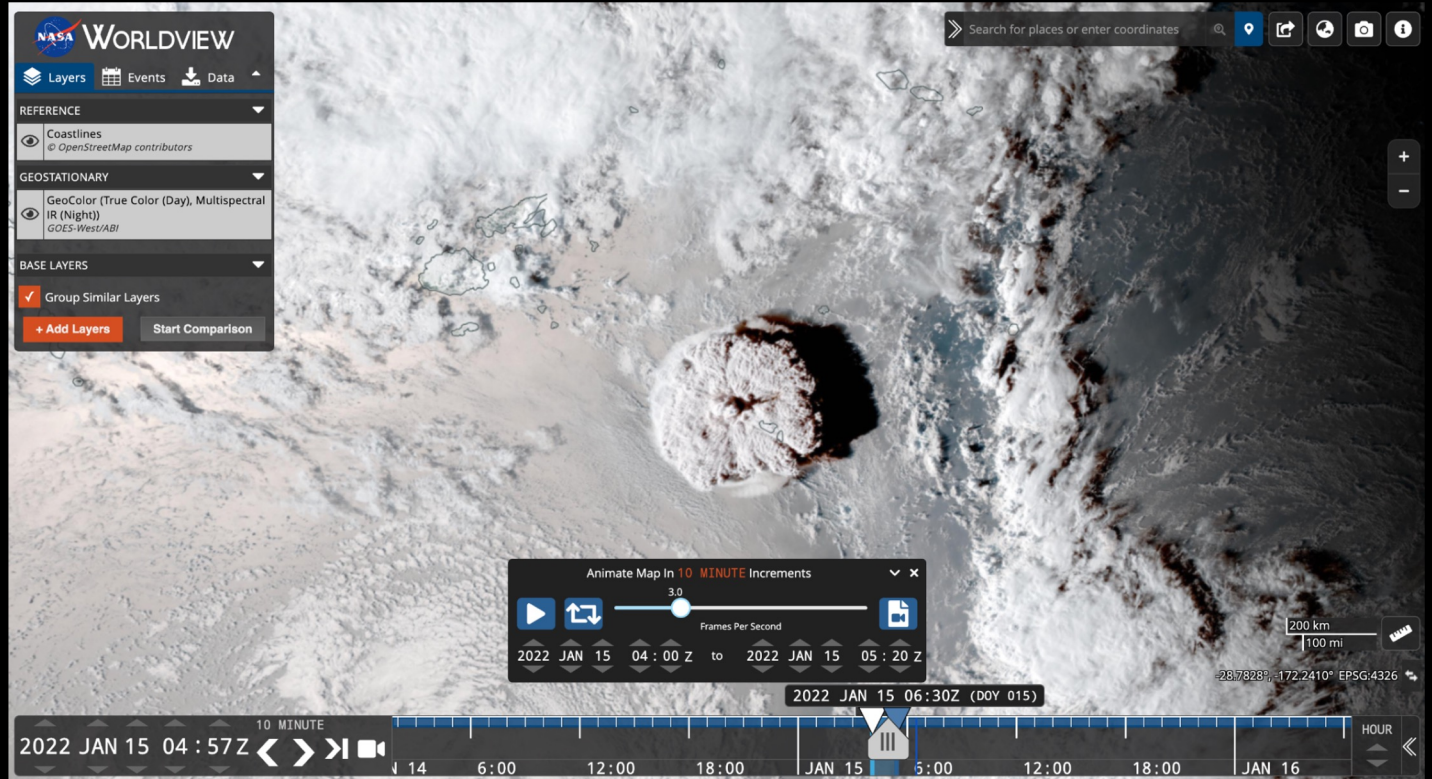
- All**: Aboveground Biomass, Absolute Dynamic Topography, Aerosol Index, Aerosol Optical Depth, Aerosol Albedo, Aerosol Type.
- Air Quality**: Aerosol Index, Aerosol Optical Depth, Aerosol Type, Carbon Monoxide, Corrected Reflectance, Dust.
- Ash Plumes**: Aerosol Index, Aerosol Optical Depth, Corrected Reflectance, Fires and Thermal Anomalies, Human Built-up And Settlement Extent, Land Surface Reflectance.
- Drought**: Corrected Reflectance, Dams, Drought Hazard, Human Built-up And Settlement Extent, Land Surface Reflectance, Land Surface Temperature.
- Dust Storms**: Aerosol Index, Aerosol Optical Depth, Aerosol Type, Dust, Corrected Reflectance, Human Built-up And Settlement Extent.
- Fires**: Aerosol Index, Aerosol Optical Depth, Aerosol Type, Fires and Thermal Anomalies, Carbon Monoxide, Corrected Reflectance.
- Floods**: Flood, Flood Hazard, Corrected Reflectance, Land Surface Reflectance, Precipitation Estimate, Precipitation Rate.
- Severe Storms**: Corrected Reflectance, Cloud Fraction, Cloud Multi Layer Flag, Cloud Phase, Cloud Pressure, Cloud Effective Radius.
- Shipping**: Corrected Reflectance, Brightness Temperature, Land Surface Reflectance, Radiance, Sea Ice, Sea Ice Brightness Temperature.

At the bottom, a timeline shows the date '2024 JAN 12' with navigation arrows and a '1 DAY' duration selector. Below the timeline are labels for 'NOV 2023', 'DEC 2023', and 'JAN 2024'. The right side of the interface shows a satellite map of the Earth with a scale bar indicating 1000 km and 1000 mi.

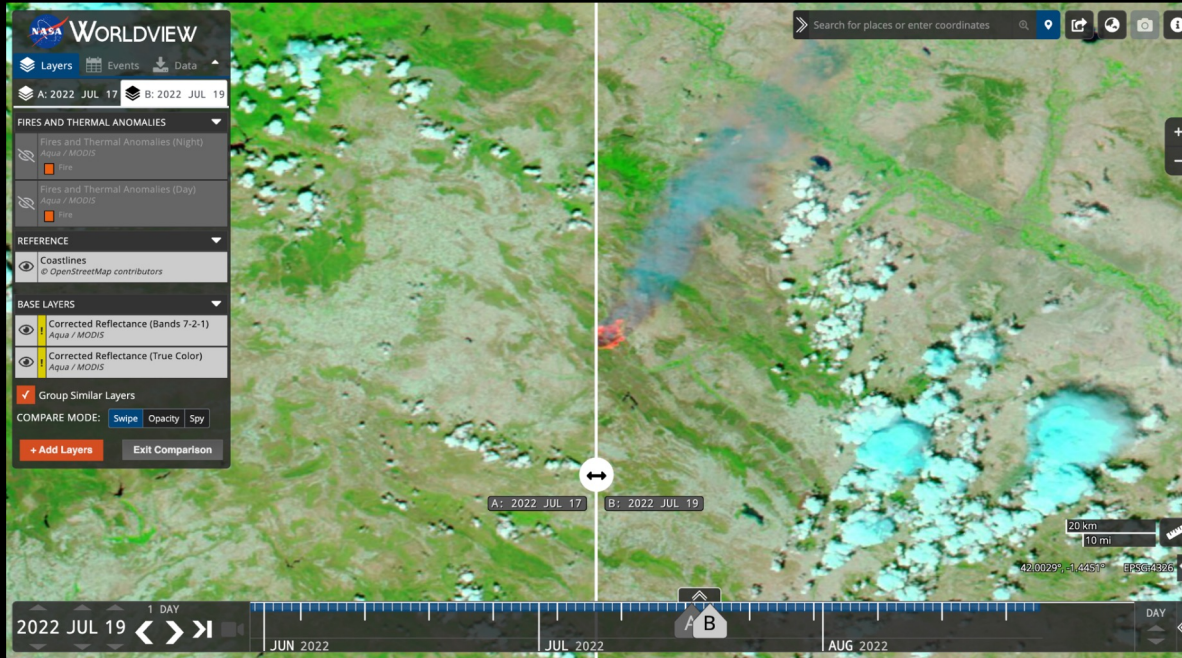
Animation

Eruption of Hunga
Tonga -
Hunga
Ha'apai
Volcano:

<https://go.nasa.gov/3pHf0Ff>



Comparison

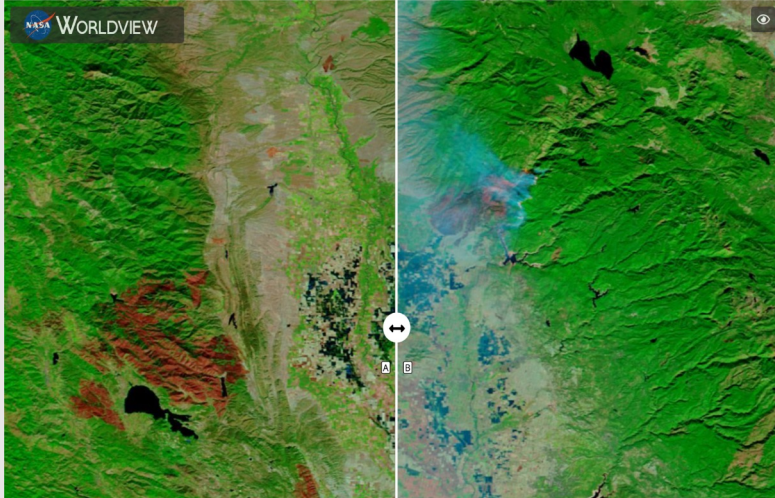


Compare imagery from two different dates, or two sets of imagery from the same date or even two sets of imagery from different dates!

Article: <https://go.nasa.gov/3KkFXrG>

Embeddable Widget

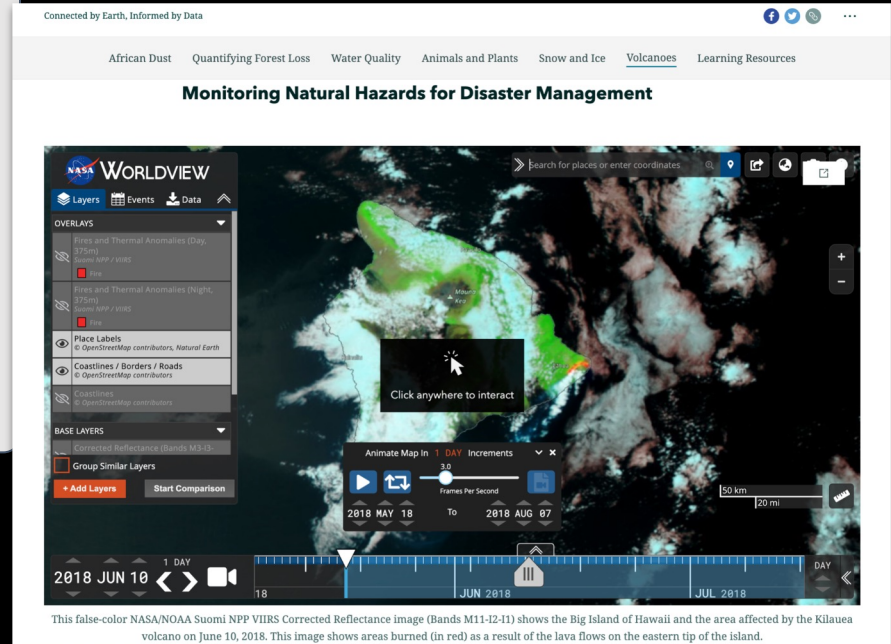
Your Webpage



Article and instructions: <https://go.nasa.gov/3PN2gra>

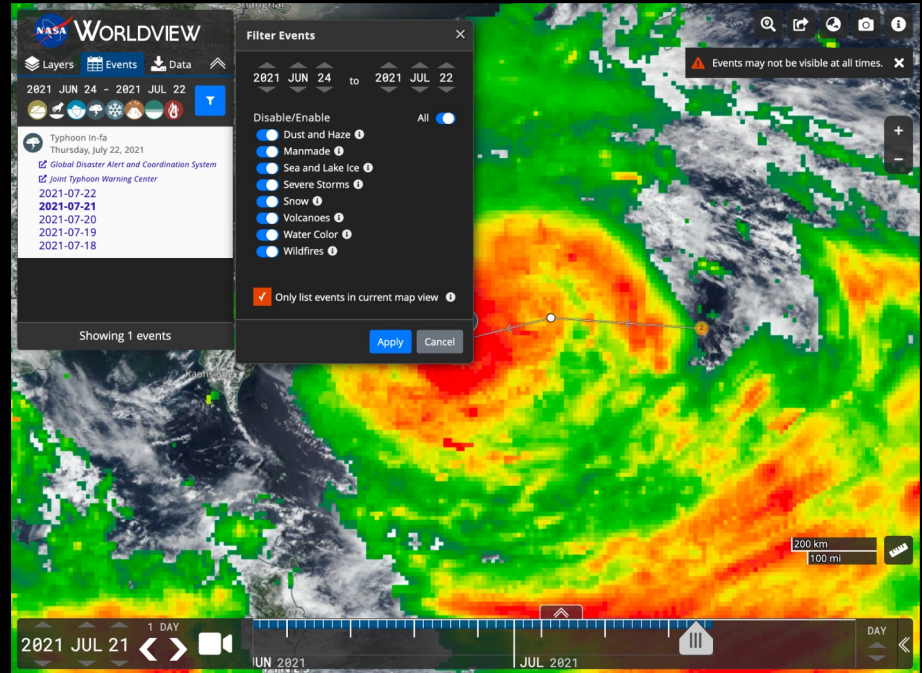
Sample usage: <https://go.nasa.gov/3cj2ZCU>

Contact us to request to have your domain added



Events

- Click on the "Events" tab in the sidebar and you will be presented with the first 50 events from the past few months.
- Click on the blue filter icon to start narrowing down the events.
- You can filter events by date, event type, and events in the current map view. Events go back to 1 January 2000, though not all event types/categories have events populated back to 1 January 2000.
- Event types include Dust and Haze, Manmade, Sea and Lake Ice, Severe Storms, Snow, Volcanoes, Water Color and Wildfires.
- You can also check the box to "Only list events in current map view" to further filter your search results.



Screenshot of the Events tab and event filter options.

<https://go.nasa.gov/3iHrvNn>

Data Download via Earthdata Search

The screenshot displays the NASA WorldView web application interface. On the left, a sidebar contains navigation tabs for 'Layers', 'Events', and 'Data'. Under 'Layers', there are sections for 'Aerosol Optical Depth 3km (3km, Land and Ocean)' and 'Corrected Reflectance (True Color)'. The 'Aerosol Optical Depth' section shows 'Standard - v6.1' and 'Near Real-Time - v6.1NRT' options. The 'Corrected Reflectance' section shows 'Near Real-Time - v2.1' and 'Near Real-Time - v2' options. A 'Set Area of Interest' checkbox is present. Below the layers, it states 'Available granules for 2022 AUG 24: 103 (773 MB)' and a 'DOWNLOAD VIA EARTHDATA SEARCH' button. The main panel is titled 'Leaving Worldview' and features the 'EARTHDATA SEARCH' logo. It contains a message: 'You are about to be transferred to the NASA Earthdata Search tool. This tool is used to download data granules using the selected layer, area of interest, and current date.' Below this message is a 'Show More Info' link. A 'COLLECTION:' section lists 'Near Real-Time - v6.1NRT' and 'MODIS/Terra Aerosol 5-Min L2 Swath 3km - NRT'. A 'LAYER:' section lists 'Aerosol Optical Depth 3km (3km, Land and Ocean)' and 'Terra / MODIS'. A 'DATE:' section shows '2022 AUG 24'. A 'Continue' button is located below the collection and layer information. At the bottom of the overlay, there is a checkbox labeled 'Do not show this message again.' The background of the interface shows a satellite map of a coastal area with a timeline at the bottom indicating '2022 AUG 24' and 'AUG 2022'.

NASA WORLDVIEW

Layers Events Data

Downloading data will be performed using NASA's Earthdata Search application.

Why are some layers not available?

Aerosol Optical Depth 3km (3km, Land and Ocean)
Terra / MODIS

- Standard - v6.1
- Near Real-Time - v6.1NRT

Corrected Reflectance (True Color)
NOAA-20 / VIIRS

- Near Real-Time - v2.1
- Near Real-Time - v2.1
- Near Real-Time - v2.1
- Near Real-Time - v2

Corrected Reflectance (True Color)
Suomi NPP / VIIRS

- Near Real-Time - v2

☐ Set Area of Interest

Available granules for 2022 AUG 24:
103 (773 MB)

DOWNLOAD VIA EARTHDATA SEARCH

Leaving Worldview

EARTHDATA SEARCH

You are about to be transferred to the NASA Earthdata Search tool. This tool is used to download data granules using the selected layer, area of interest, and current date.

[Show More Info](#)

COLLECTION:
Near Real-Time - v6.1NRT
MODIS/Terra Aerosol 5-Min L2 Swath 3km - NRT

LAYER:
Aerosol Optical Depth 3km (3km, Land and Ocean)
Terra / MODIS

DATE:
2022 AUG 24

Continue

☐ Do not show this message again.

2022 AUG 24 1 DAY

JUL 2022 AUG 2022

DAY

Learn more...

- Introduction to Worldview tour - learn about the different elements in the web mapping application:
<https://go.nasa.gov/3SveXK7>
- Tutorial: Getting Started with NASA Worldview (December 2021):
https://youtu.be/uMkuiRJr_-E
- Webinar: NASA Worldview - Explore the Earth from Past to Present with Global Satellite Observations (May 2021):
<https://youtu.be/WqkX-b-jYGI>

Thank you!

Check out NASA Worldview:

<https://worldview.earthdata.nasa.gov>

Contribute to Worldview - Source Code: <https://github.com/gibs/worldview>

Bring imagery into your own web application or GIS client: <https://earthdata.nasa.gov/gibs>

Contact us for questions or comments: support@earthdata.nasa.gov

